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ABSTRACT

This activity, one in a set of teacher-developed instructional activites for elementary-level geography, investigates the problems and promise in meeting the nutritional needs of the world's people. Graphs are the principal media for instruction. Thirty-nine statements are given from which students choose ten that show promise for feeding the world's population and ten that offer the least help. Seven graphs are provided in the material. See SO 009 140 for a general description and explanation of the elementary and secondary sets comprising this series. (Author/ND)

National Council for Geographic Education

INSTRUCTIONAL ACTIVITIES SERIES IA/E-6

POPULATION: 1 + 1 ≠ 2 MANY?

by

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Can we produce enough to meet the needs of projected populations in the near future? Can technology close the gap between population growth and food production? In recent years there have been many break-throughs in the area of food research. With this research has come evidence and real optimism that the world might be able to feed its billions for many more years than its prophets of doom believe. In this exercise of guided instruction, students perceive the problems and promise in meeting the nutritional needs of the world's people. Graphs are the principal media for instruction.

INVENTORY

1. The Squeeze, 11 minutes, Harris Film Co., available from Hank Newenhouse, 1825 Willow Road, Northfield, Illinois, 60095.

   a. This film presents problems that occur when large numbers of people are placed in a variety of situations, and

   b. should open class discussion on population issue with minimal teacher involvement.

2. A series of graphs presents a wealth of data for drawing many basic conclusions based on facts rather than speculation. These are found at the end of this set. Students should be directed in their search for state, nation and world populations and trends, available space, food and caloric supplies, agricultural production and trends.

PROSPECTS

Through small group discussion, students prioritize the following into what they consider to be the ten statements which show the greatest promise for feeding the world's billions and the ten statements which will be of the least help.

1. The largest concentrations of proteins are found in oilseeds.

2. Many products from soybeans (soybean fat flour, soybean milk) are heading for our tables.

3. Cottonseed is a source of protein. It is used in the incaparina protein mixtures of Central America.

4. Peanuts are a more concentrated source of protein than cereal grains.

5. In Indonesia there is a combined rice-fish culture. Fish are raised in the same fields with rice.

6. Fish protein concentrate is being produced.

7. Single cell protein is being produced by the culture of yeast or bacteria on various substrates, particularly hydrocarbons like petroleum.

8. Fungi can be used as animal feed and this is one means of utilizing a by-product of industry.

9. We throw away much protein when we throw away the green leaves of vegetables.

10. Algae have been used as a food source on extended space flight.

11. A wheat-soy blend (74% wheat, 24% soyflour, 2% vitamins) has now been developed and is on the way to some less developed nations. Wheat protein is a by-product of the milling industry.

12. Cheese whey has been used to develop two new beverages. One drink contains whey and soy flour with citrus flavoring. The other combines whey and cream with chocolate or fruit flavoring.

13. A U.S. company successfully developed a system using liquid freon for direct contact freezing of meats. This cuts down on meat spoilage.

14. A machine has been developed to harvest dwarf and broad beans. This eliminates a lot of hand labor and makes production a faster process.

15. Sweden has the world's first floating fish protein factory.

16. U.S. fishery experts are using the television satellite Telstar to spot schools of fish.

17. A new margarine has been developed in Sweden from a mixture of milk fat, soybeans and polyunsaturated oils.

18. Caffeine is being used as a feed for swine to improve live weight gains and produce a leaner meat.

19. Improvement of rice and increasing yields by nuclear irradiation is being experimented with in the Phillipines.

20. Bread is being made from cassava in less-developed countries.

21. Protein food from wool is being processed in New Zealand.

22. In the U.S., we are now extracting protein from alfalfa.

23. Sorghum grain (primarily an animal feed in the U.S.) is used as staple food in parts of Asia and Africa.

24. A food package that plugs into an ordinary wall socket to heat up a "convenience food" meal has been invented.

25. The U.S. Department of Health, Education, and Welfare has studied the possibility of using tomato cannery wastes as a supplement in the human diet.

26. Predictions were made in 1970 that simulated milks, which can be produced below the cost of dairy milk, will eventually replace dairy milk.

27. The faster the freezing, the better fresh food's characteristics are preserved.

28. In 1970 the Food and Agriculture Organization of the United Nations proclaimed that there was no longer a danger of world famine in the forseeable future.

29. In 1970, because of new agricultural technology, an increase in hardier and higher-yielding crops, new and better fertilizers, better irrigation practices, and wiser use of pesticides, food production was growing faster than the population.

30. In 1970, food production in developed countries remained about the same as in 1969, but India increased production by 5% and other Asian countries increased production by 4%.

31. Once again in 1970, Americans spent more money for beer than for bread, fresh fruit, or milk.

32. Coffee is declining in popularity.

33. General Mills is producing Bontrae, a meat substitute made from soybean protein. The product resembles a meat loaf and is available in beef, chicken, and ham flavors.

34. Frozen bread is sold in a box that becomes a baking pan.

35. The experimental development in the U.S. of chemical diets for astronauts resulted in certain new applications that will have far-reaching significance.

36. Wheat will grow at the Arctic Circle.

37. There are more than a thousand kinds of fruits which can be eaten.

38. One pound of Uranium-235 is about the size of a walnut, but it produces as much heat as 1500 tons of coal.

39. Israel is growing fruit in the Negev Desert without using a drop of irrigation water.

CONCLUSION

Do one and one equal too many? Although no right answer is expected from these activities, reasonable discussion and research by reasonable people should develop some reasonable alternatives.

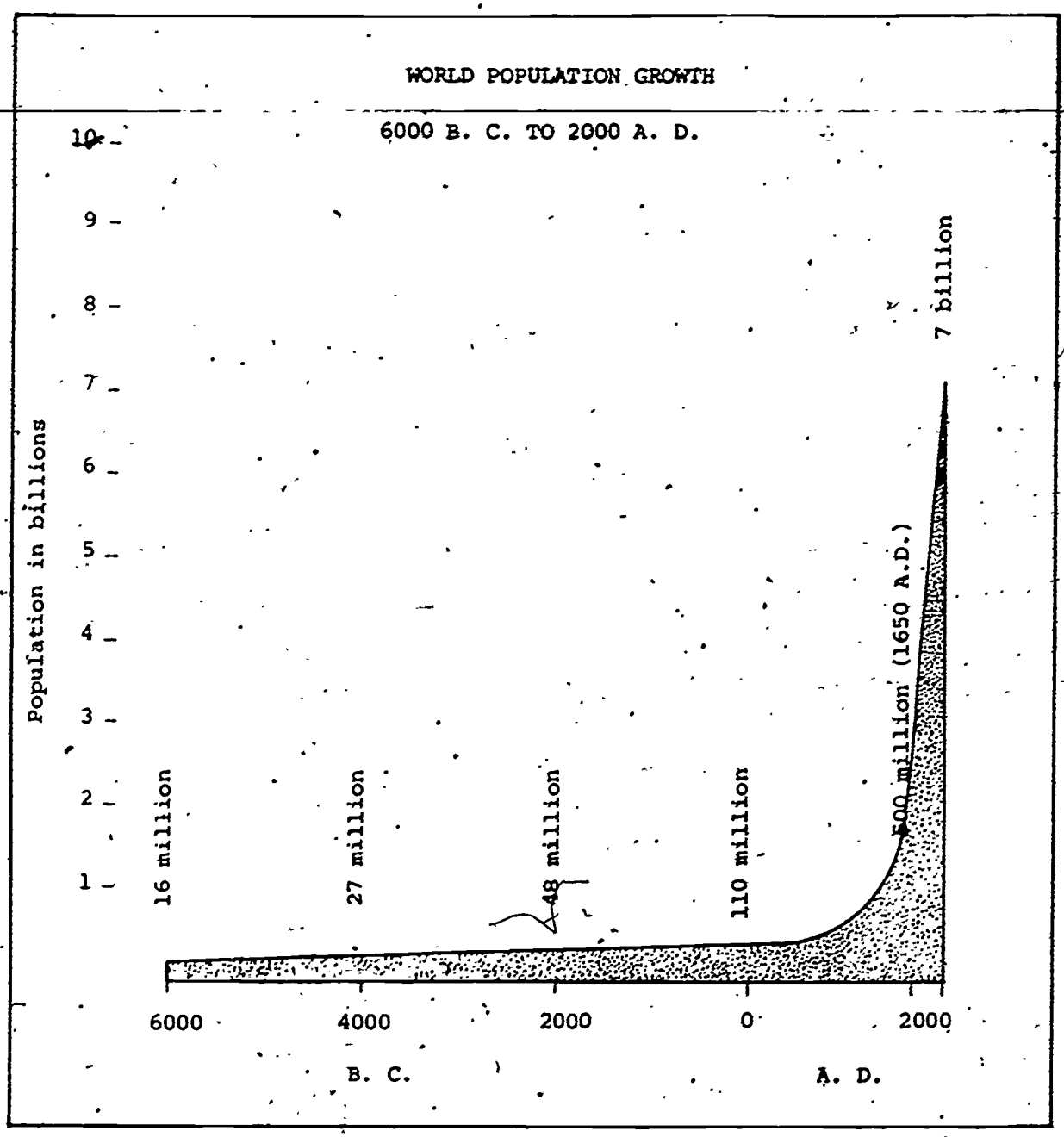


Plate 1

Source: Pop. Reference Bur.

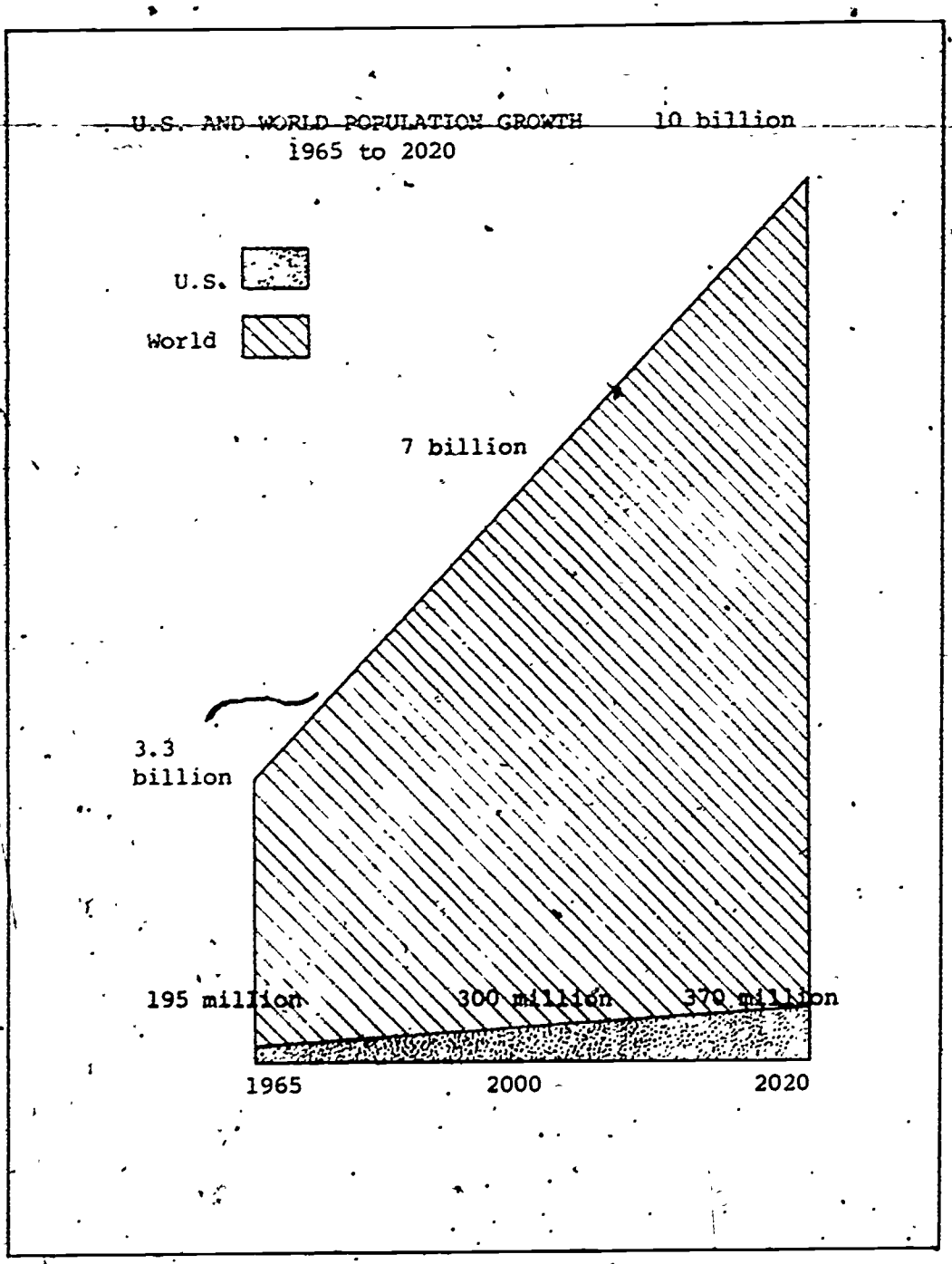

U.S. AND WORLD POPULATION GROWTH
1965 to 2020
10 billion
U.S.
World
7 billion
3.3
billion
195 million
300 million
370 million
1965
2000
2020

Plate 2

DISTRIBUTION OF THE WORLD'S POPULATION

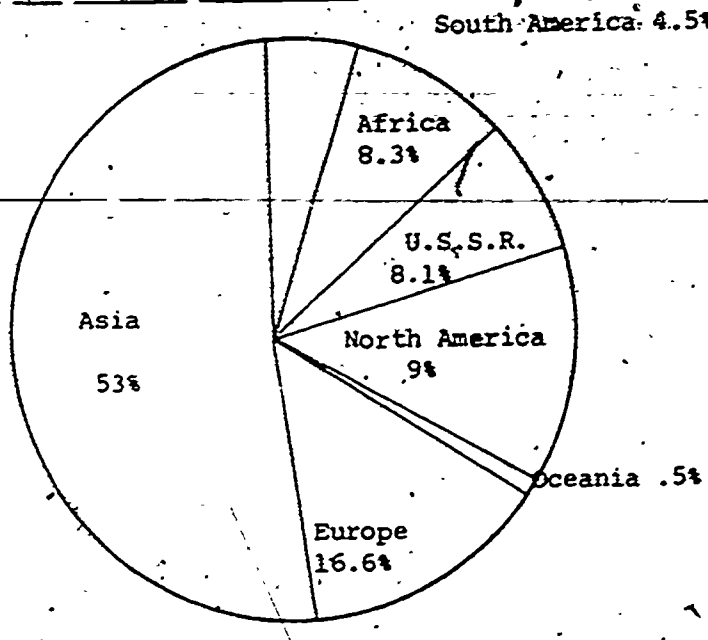


Plate 3

DISTRIBUTION OF THE WORLD'S INCOME

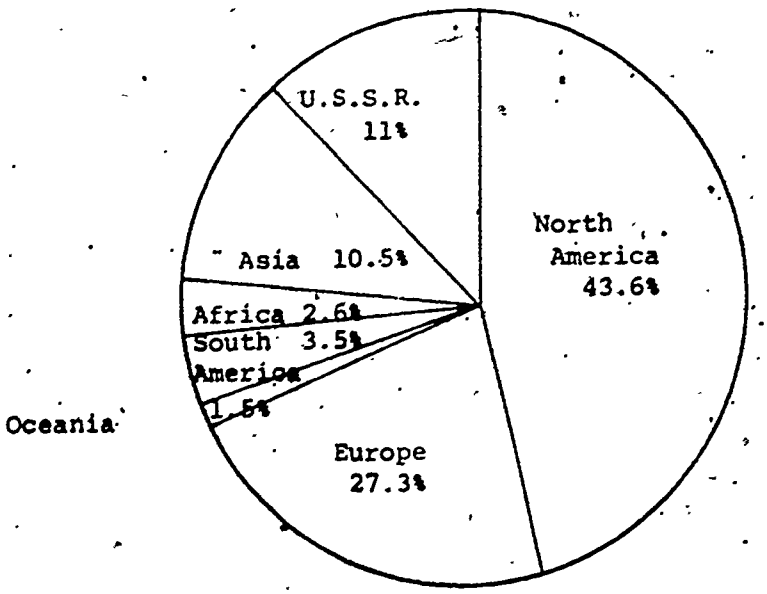


Plate 4

Source: United Nations

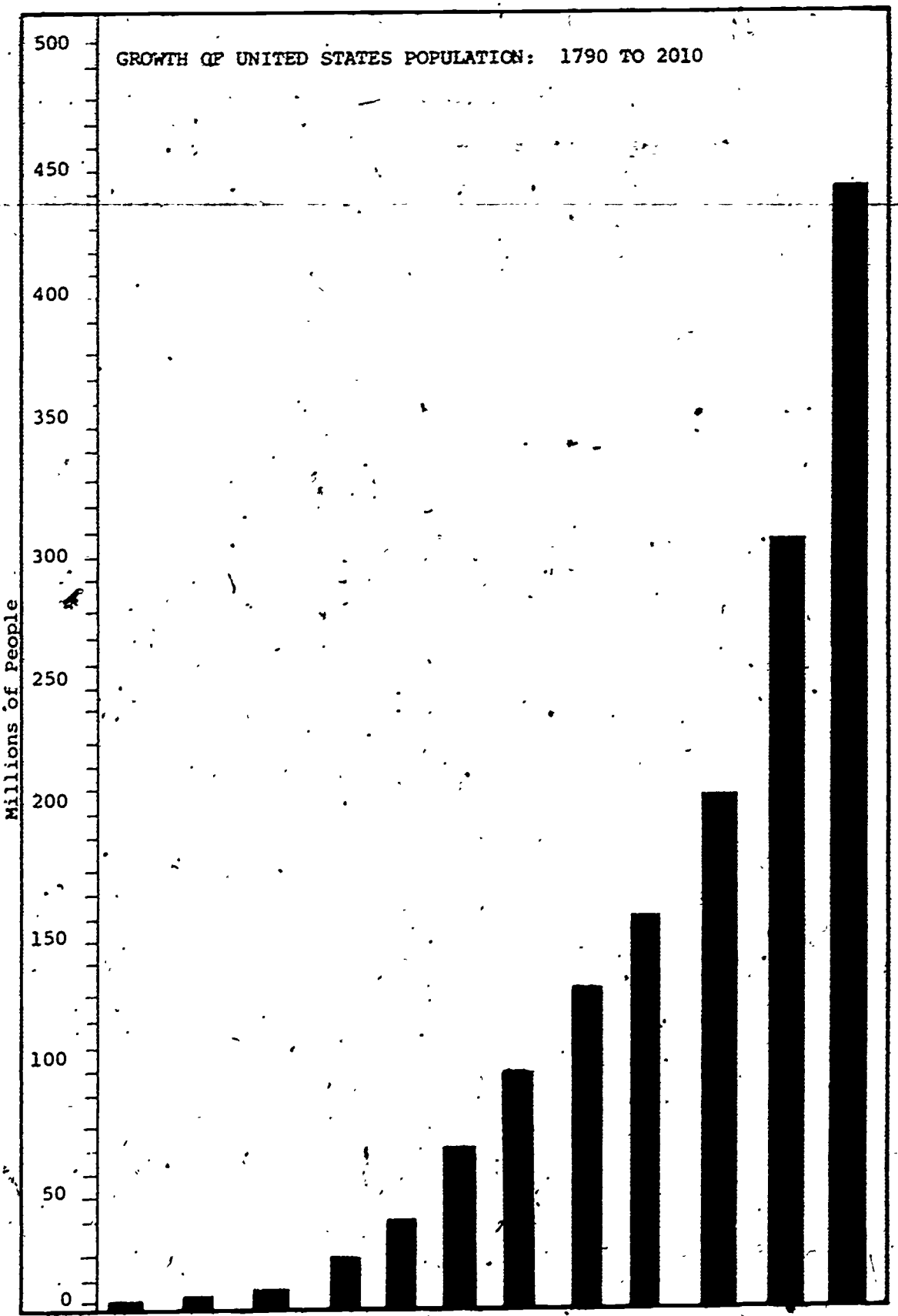
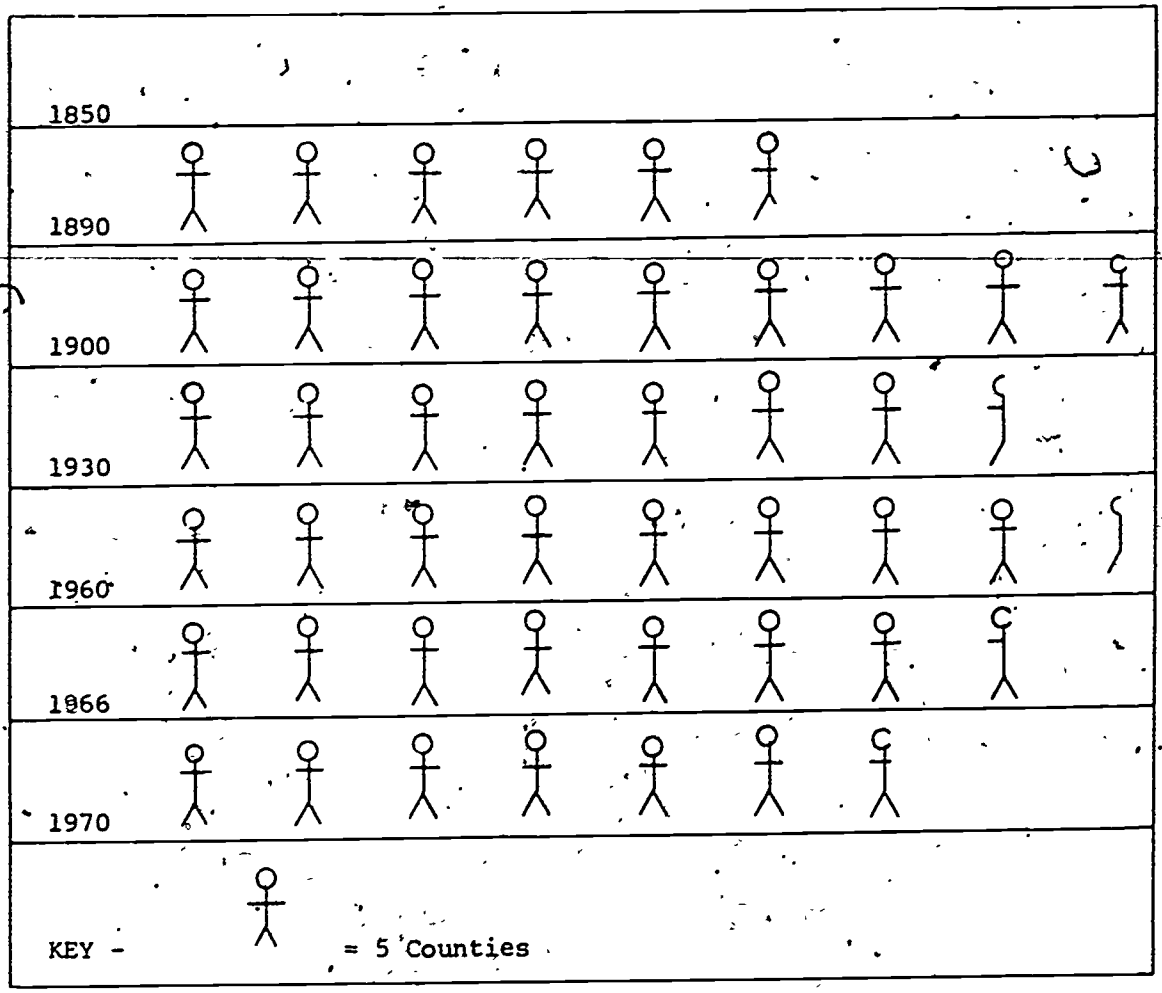


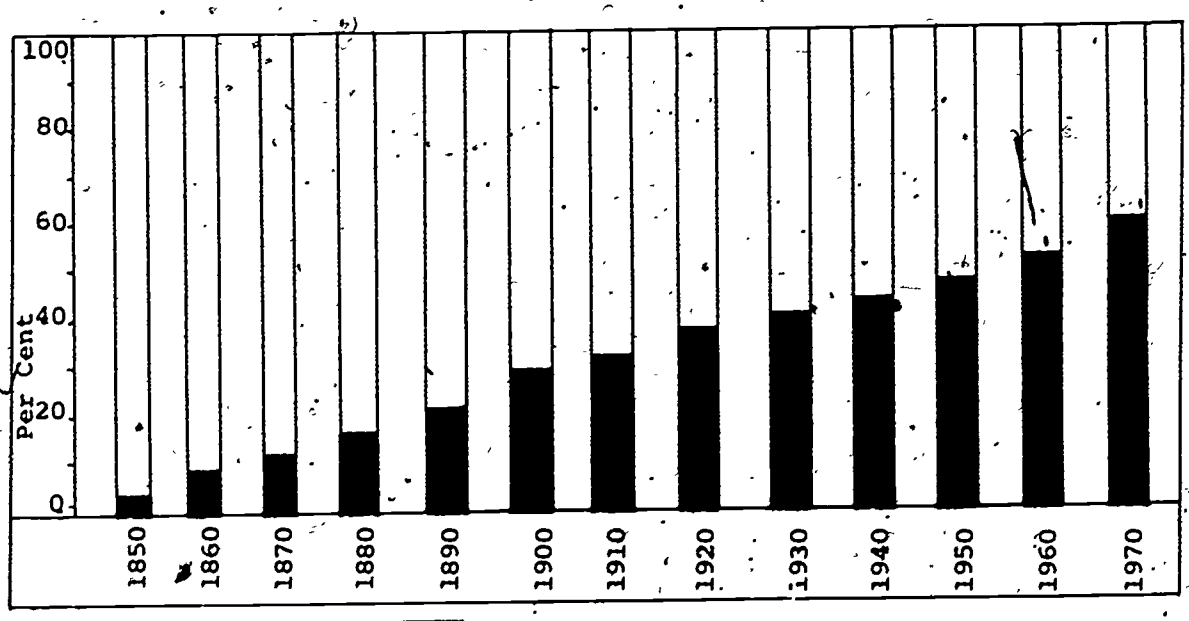
Plate 5

Source - Population Reference Bureau, U.S. Dept. of Commerce



FREQUENCY OF IOWA COUNTIES WITH A POPULATION OF OVER 20,000

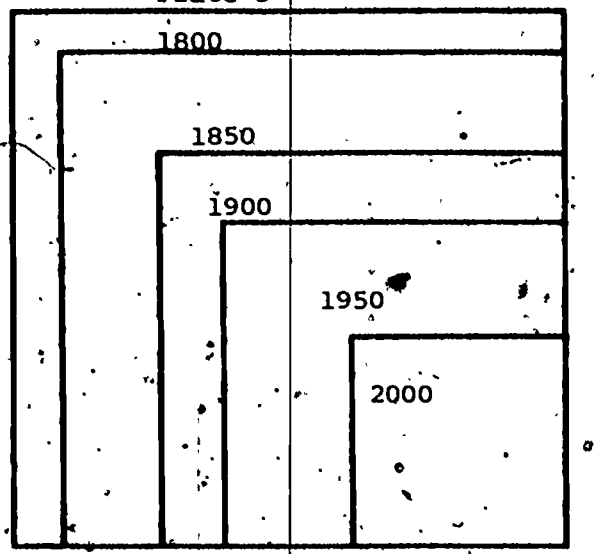
Plate 6



Urban ■ Rural □ CHANGES IN IOWA'S POPULATION (RURAL-URBAN)

Plate 7 Source - Census of State of Iowa

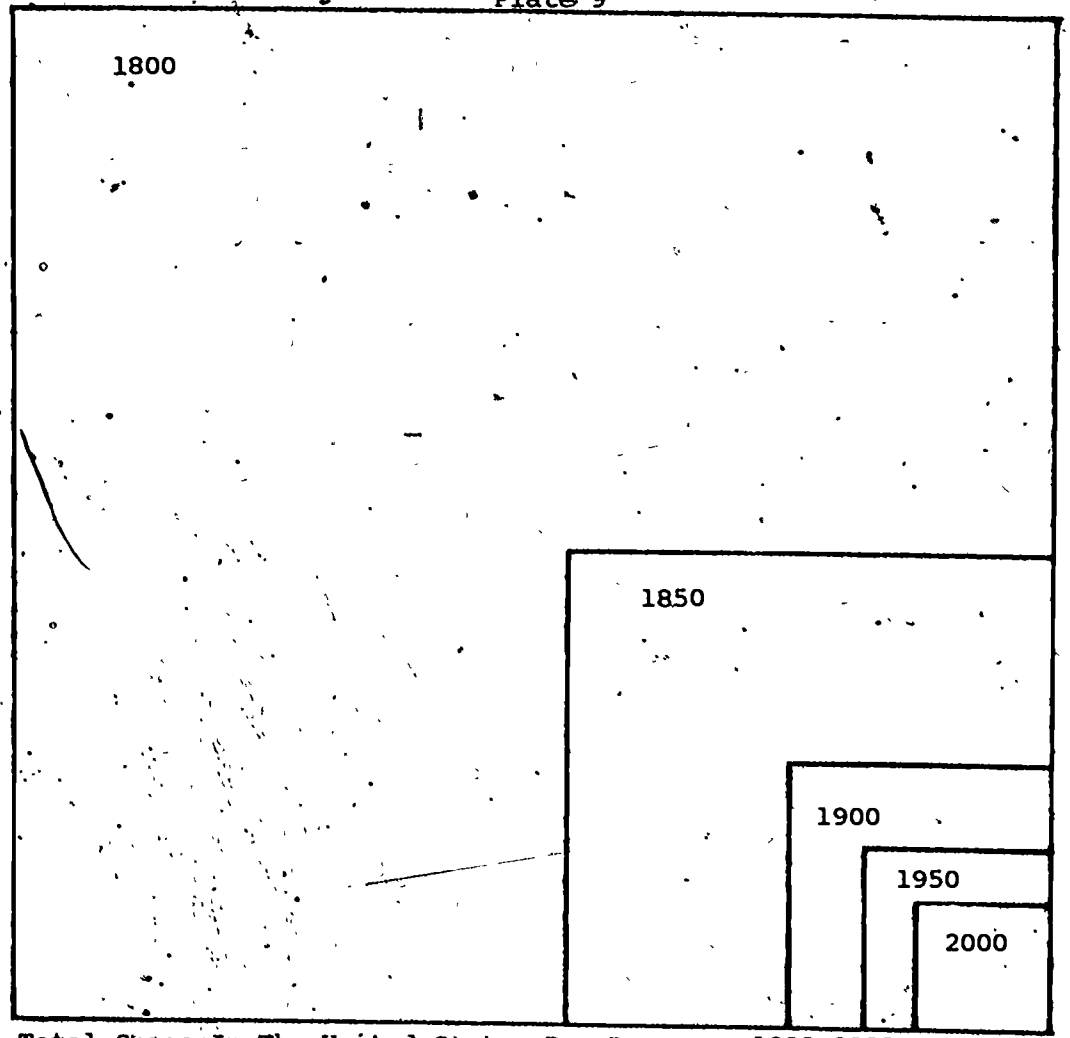
Plate 8



Total Space on The Earth Per Person
1800-2000 A.D.
(Land and Water in Acres)

1800 - 137 Acres
1850 - 111 "
1900 - 71 "
1950 - 50 "
2000 - 20 " (Projected)

Plate 9

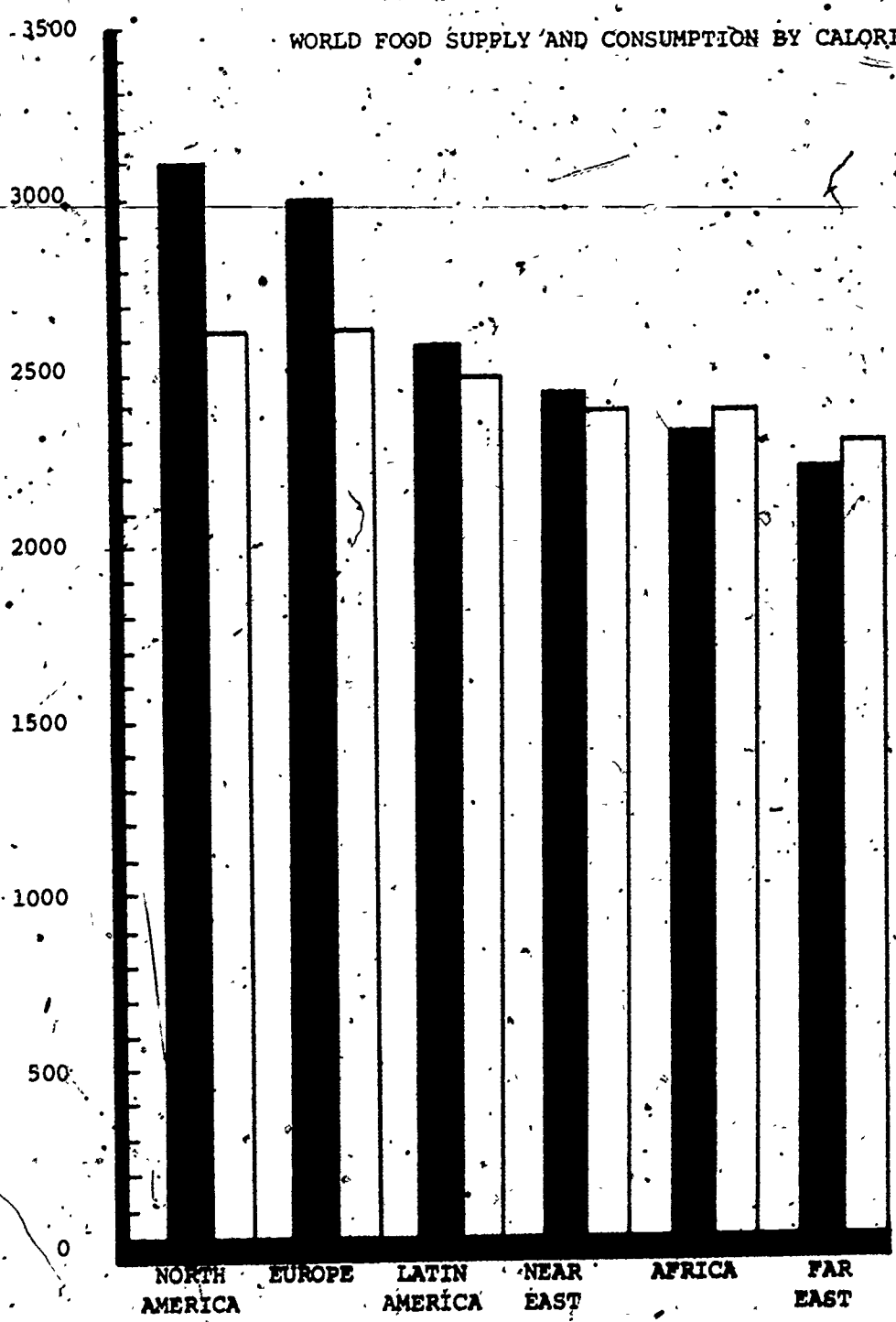


Total Space In The United States Per Person - 1800-2000
(Land and Water in Acres)

1800 - 471 Acres
1850 - 102 "
1900 - 31 "
1950 - 15 "
2000 - 7 " (Projected)

Source: Population Reference Bureau, U. S. Dept. of Commerce

WORLD FOOD SUPPLY AND CONSUMPTION BY CALORIES



Caloric Requirements Per Capita

Caloric Supply Per Capita

Source: F.A.O. Balance Sheets 1967

Plate 10

INDEXES OF AGRICULTURAL PRODUCTION IN THE DEVELOPED AND LESS DEVELOPED COUNTRIES*

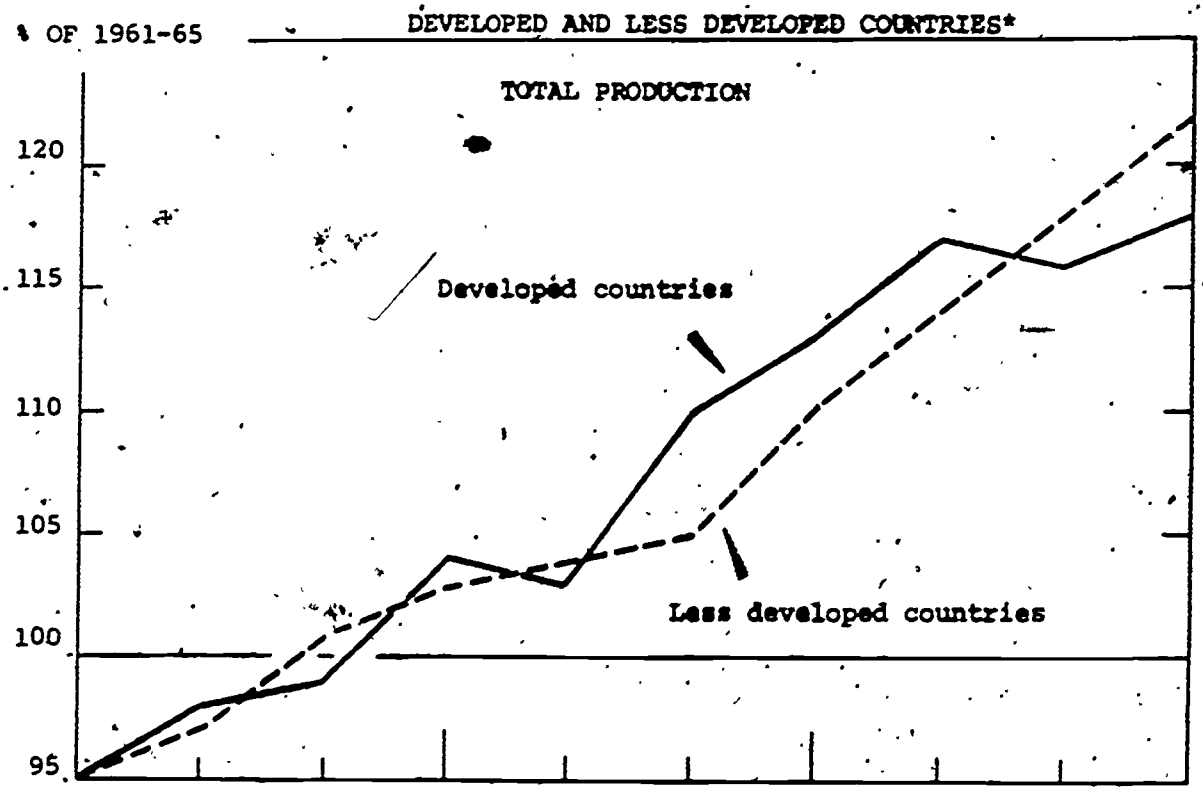


Plate 11

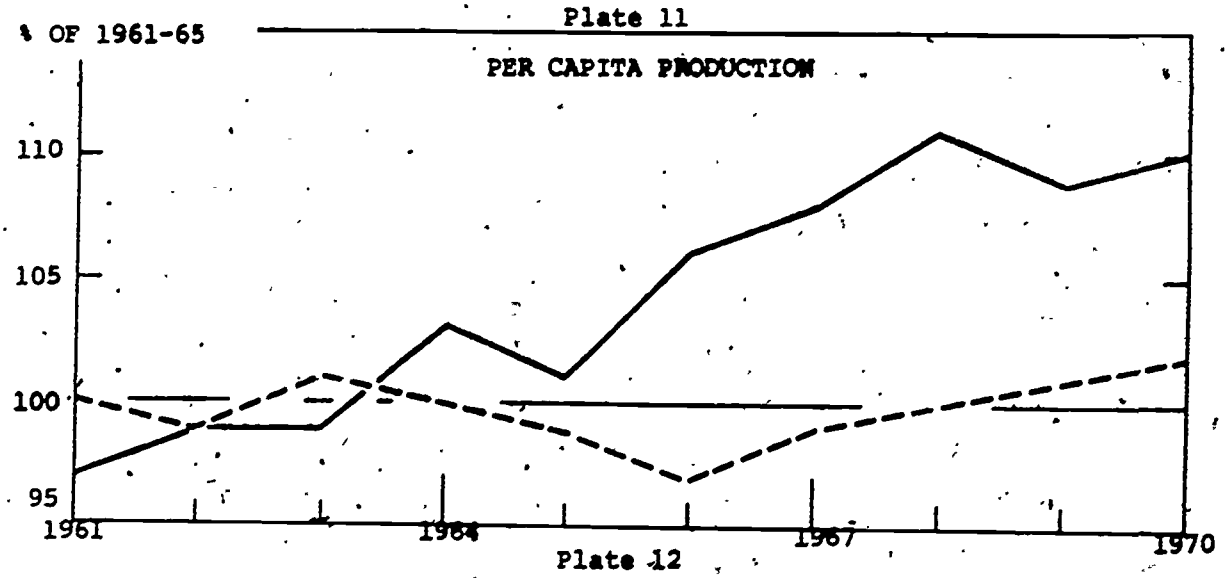


Plate 12

*Excluding Communist Asia.
Source: Foreign Regional Analysis Division, Economic Research Service, March 1971.

INDEXES OF PER CAPITA
AGRICULTURAL PRODUCTION
IN THE MAJOR LESS DEVELOPED REGIONS*

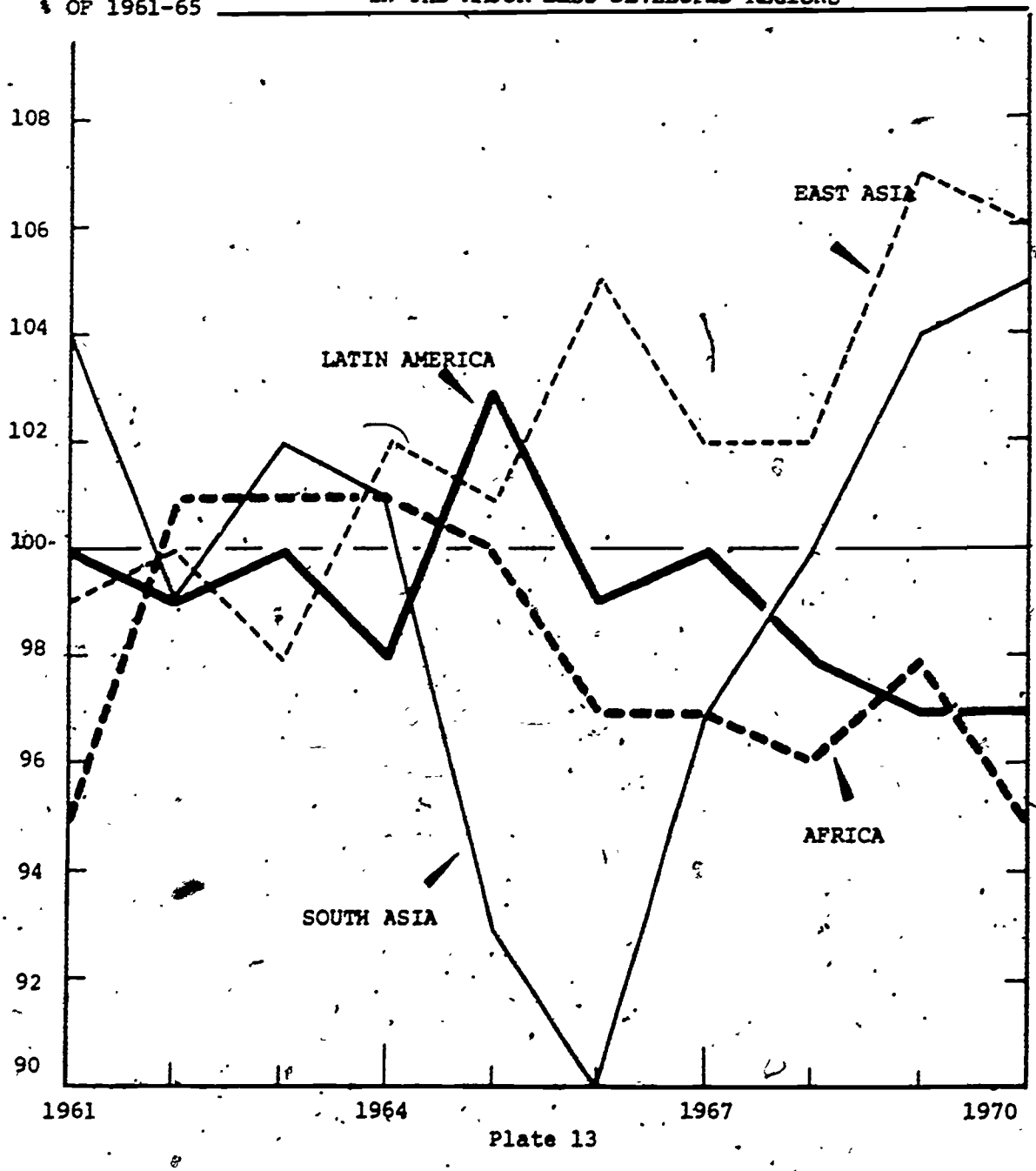


Plate 13

* Excluding West Asia and Communist Asia.
Source: Foreign Regional Analysis Division, Economic Research Service, March 1971.